

Alyn. Their origin is well indicated in these positions, by the manner in which they lie opposite the mouths of the valleys at right angles to the course of the present streams.

The most remarkable of all these is a long ridge running parallel to the Great Western Railway near Gresford. It is marked and shaded on the Ordnance geological map. Bailey Hill, Mold, is another. This is attributed to the Danes—described in the guide books as a Danish fortification. I have proved the glacial origin of these mounds by finding in them striated subangular boulders, that have travelled considerable distances; such, for example, as large blocks of the Llanarmon limestone, and rounded lumps of curly cannel, that must have crossed the ridge of the Hope Mountain, the height of which varies from 300 to 800 feet above the Leeswood and Tryddn valleys from which the coal must have been carried. On one occasion, during the construction of the Wrexham Mold and Connah's Quay Railway, I saw a large fire blazing in a navy's shed, and upon examination found that the fuel was curly cannel they had found in making a cutting. They described this find as two pieces, each one "bigger than a man's head." I brought away an unburnt fragment of about 2 lbs. weight. It was a subangular corner, smoothed and faintly striated. The nearest cannel seam to this place—which is over the millstone grit—is about four miles, with the Hope Mountain intervening.

A curious example of the unexpected bearings of scientific investigations upon commercial interest was presented by these cannel boulders. Two or three years before I commenced the study of the ancient glaciation of this district, Mr. W. C. Hussey Jones had proved the value of this curly cannel as a source of paraffin, and what are called paraffin oils, &c. Great excitement resulted, and a great rush was made to "the Flintshire oilorado." This curly cannel was sold at prices varying from twenty-five shillings to thirty shillings per ton at the pit's mouth, while the price of ordinary main coal was only six shillings. The owners of this cannel, or holders of leases or "tak notes," giving a licence to work it, made large sums of money (as much as 80,000*l.* was paid for the transfer of one lease), and consequently great search was made for new seams. Among the searchers were the farmers, landowners, and outside speculators, who commenced boring and sinking and forming companies for cannel mining in the region covered by these "hog wallows;" the evidence upon which their expectations were based being the discovery of pieces of cannel on or near the surface, turned up by the plough or otherwise. Many thousands of pounds were thus wasted. One very worthy man, that I knew very well—a hard-working Welsh farmer—spent the savings of a whole life-time in searching for cannel on his farm, where he had frequently turned up fragments in ploughing. His death speedily followed his ruin. There were many other similar cases. Had I commenced my investigations three years sooner I might have explained the strange and apparently incomprehensible anomaly of Leeswood cannel being found on the south side of the Chester and Mold Railway, and in the neighbourhood of Caergrwle, in spite of an intervening ridge of mountain.

One very curious and instructive feature of these mounds is their change of shape as we proceed from the hill slopes towards the great plain known as the Vale Royal, which was formerly a great estuary or fjord of the Dee. Instead of the long and rather steep hogback ridges we now find a general outspreading deposit dotted here and there rather sparsely with obtuse conical mounds, so obtuse and so much disturbed by agricultural operations that they can only be detected by careful observation.

My explanation of these differences is that the glacier which planned the millstone grit of the Hope Mountain by sweeping over and around it, originally spread out upon the waters of the estuary now forming the Vale Royal, and thus formed the outspread deposit; that it afterwards receded, and the icebergs that broke off and floated away from it were stranded here and there, thawed, deposited their contents, and thereby formed the mounds; while the oblong ridges mark the final step-by-step recession and oscillations of the dying glacier, which formed them partly as terminal moraines, and partly by ploughing up and thrusting before it, in the course of its advancing oscillations, the previously deposited glacial drift. I throw out these speculations suggestively, to be taken for what they are worth; they fit the facts well enough so far as I have been able to study them, but the main object of this letter is to direct attention to this and other corresponding deposits near at home that appear to me to be worthy of further investigation, especially by residents in the neighbourhood and the members of local field-clubs, &c. The Liverpool Naturalists' Field Club paid a visit to

the district while I lived there, and I showed the geological members some of these deposits. W. MATTIEU WILLIAMS  
Belmont, Twickenham, April 24

It is apparent from Prof. Le Conte's description of the prairie mounds (NATURE, vol. xv. p. 530) that the drift mounds figured and mentioned by me (vol. xv. p. 379) have quite different origins. The prairie mound would seem to be somewhat similar and have the same origin as a tussocky bog or mountain. The formation of a tussocky bog has been described in "Valleys and their Relation to Fissures, &c.," p. 14. A tussocky mountain is similarly formed—very hot weather cracks the peaty upper soil forming deep fissures; while subsequent weathering changes portions between the fissure into small hills. I lately saw on the coast of Wicklow a considerable area of Æolian drift of this hummocky nature; the hillocks being about four feet high. They were so regular as to have the appearance of being moulded from one model. These could not possibly have their origin in fissures; but they seemed to have a connection with bunches of bent, round which the wind collected heaps of sand. But again why should the bunches of this grass grow at regular intervals? In the same neighbourhood some of this Æolian drift is piled in long parallel ridges, about five or six feet high, and having quite an artificial look. These evidently are wind formed; but how it is hard to conjecture, as they run oblique to the prevailing and most effective winds.

G. H. KINAHAN

Ovoca, April 24

#### Greenwich as a Meteorological Observatory

IN Mr. Buchan's objections to the hypothesis that the temperature of Greenwich is raised by the proximity of London one most important consideration has been omitted. Granted that the mean temperature of the summer months, June to September, is 0°9 higher at Greenwich than at the eight other stations referred to, it does not follow that this alone is the cause of the higher average temperature at the former place. Greenwich occupies a position farther from the Atlantic and nearer the Continent than the majority of the selected stations, and we might therefore expect to find it subject not only to a higher temperature in summer, but also to a lower temperature in winter. If this be so, the excess which Mr. Buchan admits may be accounted for by the raising of the mean winter temperature from artificial causes; and this view of the case seem to be confirmed by observation. The station at Leyton, Essex, supplies the requisite data; for, although near London and rapidly increasing in population, it is, or rather was, in a country district when the observations were made. It is situated on the verge of Epping Forest, is separated from London by the Hackney Marshes, is rather more than 6½ miles in a direct line from St. Paul's Cathedral, from which Greenwich is 4½ miles distant, and is 7 miles nearly north of the last-mentioned place. The meteorological observations were undertaken with the express intention of comparing them with those at the Royal Observatory, with which object the instruments were mounted on a stand precisely similar to the Greenwich stand, and the exposure was unexceptionable. The comparison relates to the daily maximum and minimum temperatures for the three years ending November, 1863. The average was at Greenwich 50°4, Leyton 49°9. Allowing for elevation, the results are:—

	Annual.	Maxima.	Minima.	June to September.	December to March.	Maxima June to September.	Minima June to September.	Maxima December to March.	Minima December to March.
Greenwich...	51°0	58°9	43°0	61°0	41°9	71°0	51°1	47°7	36°1
Leyton ...	50°2	58°3	42°1	61°3	40°8	72°0	50°7	46°9	34°8
Greenwich warmer than Leyton.	+0°8	+0°6	+0°9	+0°3	+1°1	+1°0	+0°4	+0°8	+1°3

These results prove that Greenwich is warmer than Leyton, which is farther removed from the influence of London, and that during the winter months the temperature is higher both by day and night, but chiefly by night, when the excess is 1°3; also that in summer, while the nights at Greenwich are warmer than at Leyton, the days are cooler. The inference is that the artificial

heat of London sensibly affects Greenwich, mostly by raising the temperature of the air in winter and at night, when it might be expected to do so with the greatest effect; and that the temperature at Greenwich by day in summer is depressed by the smoky atmosphere hindering the transmission of the sun's rays when they are most potent.

H. S. EATON

Croydon, April 24

#### Ancient Characters at Cissbury

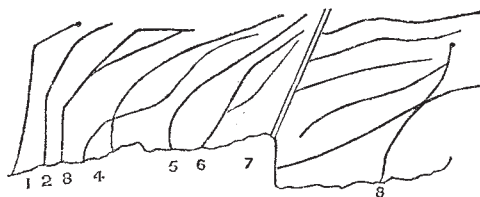
Two years ago some marks were discovered at the entrances of galleries in one of the pits at Cissbury, which appeared to have been scratched on the chalk with a flint instrument. They were suspiciously like figures or masons' marks, but yet had all the tints of age, and resembled more or less early letters.<sup>1</sup> The

little woodcuts 16, 17 represent the forms with sufficient exactness. Other marks found shortly afterwards in a second pit were thought to be merely a trellis pattern. In attempting to cut them out of the rock, the chalk was broken into fragments, but fortunately rubbings had been previously taken.

The doubt as to the genuineness of the above marks was removed by the further discovery, in September, 1875, of a third set (again at the entrance of a gallery) in another pit at Cissbury Camp. They were arranged in two lines, the lower one presenting all the appearance of an inscription. A number of detached blocks, with distinctive marks upon them, were found in this pit amongst the rubble with which it was filled. One of these blocks, which was discovered about five feet below the surface, had four definite marks scratched upon it at even distances.

Up to the time that this third pit was opened no distinctive marks had been met with, except those above-mentioned, though there were many thousand accidental pick-marks on the walls and loose chalk.

I have now the satisfaction of mentioning that upon examining with more care the marks found in the second pit, the diagonal scratches of the trellis prove to be eight branching characters of a peculiar form. The vertical scores which cross them turn out to be later additions, cut with a finer tool than the serrated flint that has left its mark on the more superficial and broader lines of the characters beneath. In the following woodcut the vertical lines are not shown, and the rune-like forms are placed slightly further apart than is actually the case; the characters themselves, however, are facsimiles<sup>2</sup> :—



Tracings and photographs have been submitted to Professors Sayce and Rhys, and also to Dr. Haigh and other palæo-graphists, who all consider the marks to be characters, though unable at present to give an opinion as to their date. But several on the detached blocks found near the surface, it is thought, may possibly be Anglo-Saxon.

Some of your correspondents may perhaps be able to say whether similar forms have been met with elsewhere. Can it be that the branching characters are examples of the symbols alluded to in the traditions of the Bards?

I may mention that Dr. Haigh thinks that the Celts had writing distinct from and earlier than the Oghams; and he has noticed on the stones of a sepulchral chamber at Keryaval, in Brittany, signs very like letters.

J. PARK HARRISON

#### The Rocks of Charnwood Forest

It has been a matter of regret to geologists that Mr. Plant has not published in some accessible form his stores of knowledge on Charnwood. We cannot tell how far our facts may be new to him, but we believe that we have been able to make considerable corrections in and additions to all contained in Jukes, Ansted, Coleman, or the Survey Memoir.

<sup>1</sup> *Journ. Anthropol. Inst.*, No. 18, p. 265.

<sup>2</sup> The last character, on the right of the inscription, has been corrected by lengthening the upper stroke. In the rubbing it was accidentally detached from the cross-lines.

We are glad to find Mr. Plant supporting us on the intrusive character of the syenites. But the question can hardly be regarded as previously settled. Mr. Coleman leaned to the idea of their priority to the stratified rocks, Prof. Jukes to their being contemporaneous, and Prof. Ansted to their being metamorphic. When in *NATURE* (vol. xv. p. 97) Prof. Green suggested the first of these views no one adduced any proof to the contrary. Of all that Mr. Plant says we were well aware, but could not regard the evidence as conclusive. Our opinion is founded on the examination of actual contacts between syenite and sedimentary rock, a thing which so far as we know has not previously been described.

We are well acquainted with the very curious "altar stones" which are doubtless of volcanic origin, but these and the rocks of Bardon no more prove the Markfield syenite to be intrusive, than the ashes and breccias of the Borrowdale series prove the intrusive character of the Wastwater granite. Further, we cannot admit any connection between the Bardon "greenstones" and the Markfield syenite.

T. G. BONNEY

St. John's College, Cambridge, April 28

E. HILL

#### Yellow Crocuses

SEVERAL years ago I observed that snowdrops which I had introduced into my garden were destroyed by poultry getting in among them at the hungry season when these are in blossom. I recollect placing a bantam cock in the garden, and observed that he pecked hastily at a few of the blossoms, and then left off. I then tore up pieces of writing-paper and spread them over the newly turned-up soil. These were hastily visited and as hastily dropped by a few of the poultry. Next I procured some Indian corn, and scattered it among the poultry for the first time. A few hens tried to swallow a grain here and there, but left the most of them. It required two or three days' experience to get them to feed on the Indian corn, and a very short time taught them to exclude snowdrop blossoms from their bill of fare. May not the case of the crocuses mentioned by Mr. Renshaw be explained as similar to that of schoolboys, who eagerly try a bright unknown berry and soon leave off when it is unpalatable? At least so I explained the fact of my snowdrops being more fiercely attacked on their first appearance in the garden than ever they have been since.

Our glen in a few weeks will be made beautiful by the blossoms of the bird-cherry, which grows plentifully on the margin of the streams and the waysides, attaining much larger dimensions than those given by Mr. Bentham in his "Handbook of British Flora," many of the trees being twenty feet high. The caterpillar of the pale spotted ermine moth feeds so eagerly on its leaves that I have, in some summers, seen the trees reduced to ugly skeletons by the middle or end of July. In autumn the beautiful red berries of the Guelder-rose adorn our thickets, but if "fruit has become beautiful so as to point it out to birds for the dissemination of the seed," we do not seem to have the birds which care for these berries, as only three weeks ago I pulled some fine clusters from a bush growing in a sheltered nook.

Tynron, Dumfriesshire, April 21

JAMES SHAW

INCLOSED is a letter that I had from my friend, Dr. Grierson, Dumfriesshire, a month ago, complaining of a pair of ducks that had gobbled up almost every one of his yellow crocuses, and only the yellow ones. I am further informed by Mr. John Young, Hunterian Museum, Glasgow, that the habit of the sparrows taking the yellow crocuses without touching the blue or striped has been long known to him.

DAVID ROBERTSON

#### The Ship-Worm

*Teredo navalis* certainly is able to endure a long continuance of fresh water. At the town of Brisbane (Queensland), piles, &c., are sheathed with "Muntz metal" to prevent its attacks. The river is subject to long-continued freshes. I remember one which lasted at least ten days, and during that time ocean-going steamers could not ascend to the town, the flood was so powerful. Brisbane is situated far below the extreme salt-water flood, but whenever there is a fresh in the river, of even small amount, the water at that town is (according to my recollection) rather more fresh than salt at the end of each ebb tide.

I never saw *Teredo* there, but I took its existence for granted, from the fact that piles, &c., were protected with metal, and the